Application No.: 09/938,644 Docket No.: M4065.0466/P466

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of forming a ~~microstrucure~~ microstructure by micromachining, comprising:

providing a substrate in a processing chamber, said substrate comprising an etchable material and having at least one contoured feature;

generating a stable ion-containing etching plasma in said processing chamber, said plasma etching the contoured feature of said substrate;

generating a magnetic field, said magnetic field being adjustable in intensity and direction;

applying an RF bias power to said substrate, said RF bias power being adjustable in intensity; and

controlling said etching of the contoured feature by creating an electron differential at said contoured feature by adjusting at least one of said magnetic field intensity, magnetic field direction, and RF bias power intensity during said etching, thereby forming a second contoured feature at said contoured feature.

2. (Original) The method of claim 1, further comprising adjusting at least said magnetic field intensity and said magnetic field direction during said etching.

3. (Original) The method of claim 1, further comprising adjusting at least said magnetic field intensity and said RF biasing power during said etching.

4. (Original) The method of claim 1, further comprising adjusting at least said magnetic field direction and said RF biasing power during said etching.

5. (Original) The method of claim 1, further comprising adjusting at least two of the magnetic field intensity, the magnetic field direction, and the RF biasing power simultaneously.

6. (Original) The method of claim 1, further comprising adjusting the magnetic field intensity, the magnetic field direction, and the RF biasing power simultaneously.

7. (Original) The method of claim 1, wherein said plasma comprises free electrons and ions, said method further comprising adjusting at least one of said magnetic field intensity and direction to effect the path of travel of said free electrons whereby a plurality of said electrons form a high negative charge density region on said substrate; and adjusting said RF biasing power to effect the velocity of said ions toward said substrate, wherein said velocity of said ions is also effected by said high negative charge density region.

8. (Previously Presented) The method of claim 1, further comprising adjusting at least two of said magnetic field intensity, said magnetic field direction, and said RF bias power, as a function of time.

9. (Original) The method of claim 8, further comprising adjusting said magnetic field intensity and said magnetic field direction.

10. (Original) The method of claim 8, further comprising adjusting said magnetic field intensity and said RF bias power.

11. (Original) The method of claim 8, further comprising adjusting said magnetic field direction and said RF bias power.

12. (Original) The method of claim 1, wherein said etchable material comprises silicon oxide.

13. (Original) The method of claim 1, wherein said etchable material comprises silicon nitride.

14. (Previously Presented) The method of claim 1, wherein said at least one contoured feature of said substrate comprises at least one depressed area within said substrate.

15. (Original) The method of claim 14, wherein said depressed area comprises a trench.

16. (Original) The method of claim 14, wherein said depressed area comprises a hole.

17. (Previously Presented) The method of claim 1, wherein said at least one contoured feature of said substrate comprises at least one substrate protrusion.

18. (Original) The method of claim 17, wherein said at least one protrusion comprises a pillar.

19. (Original) The method of claim 1, further comprising generating said plasma from a noble gas.

20. (Original) The method of claim 1, further comprising generating said plasma from a fluorocarbon gas.

21. (Original) The method of claim 1, further comprising generating said plasma from an oxygen gas.

22. (Original) The method of claim 1, further comprising generating said plasma from a carbon chloride gas.

23. (Original) The method of claim 1, wherein said magnetic field is strong enough to effect the path of travel of free electrons, but too weak to effect the path of ions of said plasma.

24. (Original) The method of claim 1, further comprising generating said magnetic field with permanent magnets.

25. (Original) The method of claim 1, further comprising generating said magnetic field with electric coils.

26. (Original) The method of claim 1, further comprising applying an RF bias power in a range between about 0 watts and about 5000 watts.

27. (Original) The method of claim 1, further comprising biasing said substrate with an inductive power in a range between about 300 watts and about 10,000 watts.

28. (Previously Presented) A method of forming a fabricated device, comprising:

providing a contoured workpiece;

generating a stable plasma, said plasma comprising free electrons and ions, said free electrons having a velocity toward said workpiece;

generating a magnetic field at said workpiece and within said plasma;

forming a high negative charge density region on a contoured region of said workpiece by effecting the path of travel of said free electrons with said magnetic field, thereby forming a contoured feature at said contoured region; and

changing the location of said high negative charge density region by changing a direction of said magnetic field while etching said workpiece with said plasma.

29. (Original) The method of claim 28, further comprising applying an RF bias power to said substrate during said etching.

30. (Original) The method of claim 28, wherein said magnetic field is strong enough to effect the path of travel of said free electrons, but not strong enough to effect the path of said ions.

31. (Original) The method of claim 28, further comprising controlling said magnetic field in at least one of its intensity and direction relative to said workpiece, during said etching to alter the path of travel of said free electrons.

32. (Previously Presented) The method of claim 29, further comprising adjusting the RF bias power to effect the velocity of said ions toward said workpiece during said etching.

33. (Previously Presented) The method of claim 28, further comprising adjusting said magnetic field in intensity and said magnetic field direction during said etching.

34. (Previously Presented) The method of claim 29, further comprising adjusting said magnetic field in intensity and said RF bias power during said etching.

35. (Previously Presented) The method of claim 29, further comprising adjusting said magnetic field direction and said RF bias power during said etching.

36. (Previously Presented) The method of claim 29, further comprising adjusting at least one of said magnetic field in intensity and direction, with said RF bias power, relative to each other and as a function of time during said etching.

37. (Original) The method of claim 34, further comprising adjusting said magnetic field intensity and said RF bias power simultaneously during said etching.

38. (Original) The method of claim 35, further comprising adjusting said magnetic field direction and said RF bias power simultaneously during said etching.

39. (Original) The method of claim 28, further comprising rotating one of said workpiece and said magnetic field relative to the other.

40. (Previously Presented) The method of claim 28, wherein said workpiece comprises a layer of insulating material with a contoured region which is etched by said plasma.

41. (Original) The method of claim 40, wherein said fabricated device is formed in said layer of insulating material.

42. (Original) The method of claim 41, wherein said insulating material comprises silicon oxide.

43. (Original) The method of claim 41, wherein said insulating material comprises silicon nitride.

44. (Previously Presented) The method of claim 28, wherein said contoured region of said workpiece comprises at least one depressed area within said workpiece.

45. (Original) The method of claim 44, wherein said depressed area comprises a trench.

46. (Original) The method of claim 44, wherein said depressed area comprises a hole.

47. (Previously Presented) The method of claim 28, wherein said contoured region of said workpiece comprises at least one workpiece protrusion.

48. (Original) The method of claim 47, wherein said workpiece protrusion comprises a pillar.

49. (Original) The method of claim 28, further comprising generating said magnetic field with permanent magnets.

50. (Original) The method of claim 28, further comprising generating said magnetic field with at least one electric coil.

51. (Original) The method of claim 29, further comprising applying said RF bias power to said workpiece in a range between about 0 and about 500 watts.

52. (Original) The method of claim 29, further comprising applying an inductive power to said substrate in a range between about 300 and about 10,000 watts.

53. (Currently Amended) A method of plasma etching a material layer to form a microstructure, comprising:

providing a material layer having at least one contour;

flowing gas into a chamber containing said material layer;

generating a stable etching plasma from said gas, wherein said plasma comprises free electrons and ions;

asymmetrically etching said material layer at said at least one contour with said plasma to form a second contour at said at least one contour; and

varying the location of said etching during said etching by varying a location of impingement of said free electrons on said material layer.

54. (Original) The method of claim 53, further comprising varying said location by generating a magnetic field within said chamber and varying the direction of said magnetic field.

55. (Original) The method of claim 53, wherein said material layer comprises a silicon oxide layer.

56. (Original) The method of claim 53, wherein said material layer comprises a silicon nitride layer.

57. (Previously Presented) The method of claim 53, wherein said at least one contour comprises at least one depressed area with said material area.

58. (Original) The method of claim 57, wherein said depressed area comprises a trench.

59. (Original) The method of claim 57, wherein said depressed area comprises a hole.

60. (Previously Presented) The method of claim 53, wherein said at least one contour comprises at least one protrusion.

61. (Original) The method of claim 60, wherein said protrusion is a pillar.

62. (Original) The method of claim 53, further comprising generating said plasma from a gas selected from the group consisting of noble gases, fluorocarbons, oxygen, carbon chlorides, or mixtures thereof.

63. (Currently Amended) The method of claim [[64]] 54, further comprising generating said magnetic field to be strong enough to influence the velocity of said free electrons, but weak enough not to influence the path of said ions.

64. (Original) The method of claim 63, further comprising generating said magnetic field by permanent magnets.

65. (Original) The method of claim 63, further comprising generating said magnetic field by at least one electric coil.

66. (Currently Amended) A method of forming a plasma etched device, comprising:

providing a contoured workpiece comprising an insulating material in a plasma chamber;

generating a stable plasma within said chamber from a gas flow, said plasma comprising free electrons and ions, said free electrons having a path of travel toward said workpiece, said ions etching said workpiece, thereby forming a contoured feature at a contour of said workpiece;

generating a magnetic field at said workpiece and controlling said magnetic field in intensity and direction to vary a location of impingement of said free electrons on said workpiece, ~~a~~ said location of impingement of said ions on said workpiece being effected by the location of impingement of free electrons on said workpiece; and

applying an RF bias power to said workpiece during ion etching and adjusting said RF bias power during etching to vary the intensity of etching.

67-77. (Cancelled)